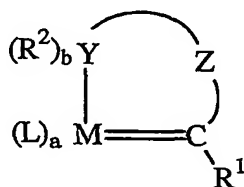


WHAT IS CLAIMED IS:

1. A method of stabilizing an olefin metathesis product mixture comprising
(a) contacting an olefin metathesis product mixture comprising one or more olefins obtained
in a metathesis process, a metathesis catalyst comprising a catalytic metal, optionally, one or
5 more metathesis catalyst degradation products, and optionally, one or more metals derived
from sources other than the catalyst and catalyst degradation products, with an adsorbent; or
(b) subjecting the olefin metathesis product mixture to a first distillation to remove
substantially volatiles and lights, and thereafter, subjecting bottoms from the first distillation
to a second distillation; the (a) adsorbent or (b) distillation method being conducted under
10 conditions sufficient to remove metal(s) to a concentration sufficient to stabilize the product
mixture.
2. The method of Claim 1 wherein the olefin metathesis product mixture
comprises a C₂₋₂₀ substituted or unsubstituted olefin or a mixture thereof.
3. The method of Claim 2 wherein the C₂₋₂₀ substituted or unsubstituted olefin is
15 a monoolefin or a polyolefin.
4. The method of Claim 1 wherein the olefin metathesis product mixture
comprises a C₂₋₂₀ α -olefin, a C₂₋₂₀ α,ω -unsaturated acid, a C₂₋₂₀ α,ω -unsaturated ester, or a
combination thereof.
5. The process of Claim 1 wherein the catalytic metal is selected from
20 ruthenium, tungsten, molybdenum, rhenium, or a combination thereof.
6. The process of Claim 1 wherein the metathesis catalyst is selected from the
group consisting of dichloro-3,3-diphenylvinylcarbene-bis(tricyclohexylphosphine)-ruthenium
(II), bis(tricyclohexylphosphine)benzylidene ruthenium dichloride,
bis(tricyclohexylphosphine)benzylidene ruthenium dibromide, tricyclohexylphosphine[1,3-
25 bis(2,4,6-trimethylphenyl)-4,5-dihydroimidazol-2-ylidene][benzylidene]ruthenium dichloride,
tricyclohexylphosphine[1,3-bis(2,4,6-trimethylphenyl)-4,5-dihydroimidazol-2-
ylidene][benzylidene]ruthenium dibromide, and tricyclohexylphosphine[1,3-bis(2,4,6-
trimethylphenyl)-4,5-dihydroimidazol-2-ylidene][benzylidene]ruthenium diiodide.
7. The process of Claim 1 wherein the metathesis catalyst is selected from
30 dichloro-3,3-diphenylvinylcarbene-bis(tricyclohexylphosphine)-ruthenium (II),
bis(tricyclohexylphosphine)benzylidene ruthenium dichloride, tricyclohexylphosphine[1,3-
bis(2,4,6-trimethylphenyl)-4,5-dihydroimidazol-2-ylidene]{benzylidene}ruthenium (IV)

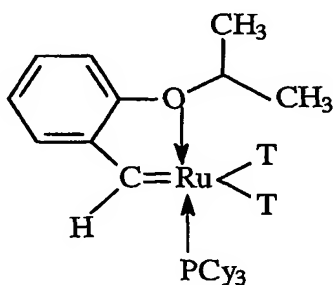
dichloride, tricyclohexylphosphine[1,3-bis(2,4,6-trimethylphenyl)-4,5-dihydroimidazol-2-ylidene]{benzylidene}ruthenium (IV) dibromide, tricyclohexylphosphine[1,3-bis(2,4,6-trimethylphenyl)-4,5-dihydroimidazol-2-ylidene]{benzylidene}ruthenium (IV) diiodide, and chelated ruthenium complexes represented by the following formula:

5



wherein M is Ru; each L is independently selected from neutral and anionic ligands in any combination that balances the bonding and charge requirements of M; a is an integer, preferably from 1 to about 4, which represents the total number of ligands L; R¹ is selected from hydrogen, straight-chain or branched alkyl, cycloalkyl, aryl, and substituted aryl radicals; Y is an electron donor group of an element from Group 15 or 16 of the Periodic Table; each R² is independently selected from hydrogen, alkyl, cycloalkyl, aryl, and substituted aryl radicals sufficient to satisfy the valency of Y; b is an integer, preferably 0 to about 2, representing the total number of R² radicals; and Z is an organic diradical that is bonded to both Y and the carbene carbon (C) so as to form a bidentate ligand, which ligand in connection with the M atom forms a ring of from about 4 to about 8 atoms.

8. The process of Claim 1 wherein the metathesis catalyst is:



wherein each T is independently selected from Cl and Br, and PCy₃ is tricyclohexylphosphine.

9. The process of Claim 1 wherein the metathesis catalyst is supported on a catalyst support.

10. The process of Claim 1 wherein metals other than those derived from the catalyst and catalyst degradation products are present and the metals are selected from iron, nickel, copper, zinc, cobalt, chromium, lithium, sodium, potassium, magnesium, calcium, and mixtures thereof.

5 11. The process of Claim 1 wherein the catalyst degradation product is derived from the reaction of the ligand with oxygen or water.

12. The process of Claim 1 wherein the olefin metathesis product mixture is contacted with an adsorbent.

10 13. The process of Claim 12 wherein the adsorbent is selected from carbon, clays, reticular cross-linked ion-exchange resins, alumina, silica-alumina, and mixtures thereof.

14. The process of Claim 13 wherein the adsorbent is a wood carbon.

15. The process of Claim 12 wherein the contacting with adsorbent is effected at a temperature greater than about -5°C and less than about 50°C.

15 16. The process of Claim 1 wherein the olefin metathesis product mixture is subjected to distillation as in (b) to remove metal(s) to a concentration of less than about 100 ppb.

17. The process of Claim 16 wherein the first distillation to remove lights and volatiles is operated at a temperature greater than about 40°C and less than about 150°C and a pressure greater than about 15 mm Hg (20 kPa) and less than about 100 mm Hg (132 kPa).

20 18. The process of Claim 16 wherein the second distillation is conducted in a short path wiped-film evaporator that is operated at a temperature greater than about 150°C and less than about 200°C.

25 19. The process of Claim 16 wherein the second distillation is conducted in a short path wiped-film evaporator that is operated at a pressure greater than about 0.001 mm Hg (1.3 Pa) and less than about 5 mm Hg (6.6 kPa).

20. The process of Claim 1 wherein the concentration of metal(s) after stabilization is less than about 30 ppm by weight.

21. The process of Claim 1 wherein the concentration of metal(s) after stabilization is less than about 1 ppm by weight.

30 22. A stabilized olefin metathesis product composition comprising one or more olefins produced in a metathesis process and having a total concentration of metals of less

than about 30 parts per million by weight, based on the weight of the olefin metathesis product mixture.

23. The stabilized olefin metathesis product composition of Claim 23 wherein the product olefin is selected from the group consisting of C₂₋₂₀ α -olefins, C₂₋₂₀ α,ω -unsaturated esters, C₂₋₂₀ α,ω -unsaturated acids, and combinations thereof.

24. The composition of Claim 23 further comprising one or more metathesis catalyst ligands, metathesis catalyst degradation products, or a combination thereof.

25. The composition of Claim 23 further comprising a solvent.

26. The composition of Claim 23 further comprising a stabilizing ligand.

27. The composition of Claim 23 further comprising one or more unconverted reactant olefins.

28. A method of removing metal(s) from an olefin metathesis product mixture comprising contacting a mixture comprising one or more olefins obtained in a metathesis process and one or more catalytic and/or non-catalytic metals with an adsorbent under conditions sufficient to reduce the total metal concentration to less than about 30 parts per million by weight, based on the weight of the olefin metathesis product mixture.

29. The method of Claim 28 wherein the adsorbent is selected from the group consisting of carbon, diatomaceous earth, clays, silica gel, reticular cross-linked ion-exchange resins, alumina, silica-alumina, and combinations thereof.

30. The method of Claim 28 wherein the adsorbent is a wood carbon.

31. A method of removing metal(s) from an olefin metathesis product mixture comprising subjecting a product mixture comprising one or more olefins obtained in a metathesis process and one or more catalytic and/or non-catalytic metals to a first distillation under conditions sufficient to remove substantially volatiles and lights, and thereafter, subjecting bottoms from the first distillation to short path wiped-film evaporation under conditions sufficient to reduce the total metal concentration in the olefin product mixture to less than about 30 parts per million by weight, based on the weight of the olefin metathesis product mixture.

32. The method of Claim 31 wherein the temperature of the short path wiped-film evaporation is greater than about 150°C and less than about 200°C.

33. The method of Claim 31 wherein the pressure in the short path wiped-film evaporator is greater than about 0.001 mm Hg (1.3 Pa) and less than about 5 mm Hg (6.6 kPa).

34. The method of Claim 28 or 31 wherein the olefin metathesis product mixture
5 comprises 1-decene, methyl decenoate, and methyl oleate.